

FBLA MS Exploring Computer Science*

Coding Basics (10 test items)

1. Describe basic programming elements (e.g., variables, loops, conditionals)
2. Describe the parts of a function call
3. Predict the output of a function given its definition and input
4. Trace the value of variables through a program
5. Distinguish between runtime and compile-time errors

Algorithmic Thinking (10 test items)

1. Identify basic search algorithms (e.g., linear, binary, two-pointers)
2. Identify basic sorting algorithms (e.g., bubble sort, heap sort, merge sort)
3. Distinguish between common data structures (e.g., lists, arrays, sets, queues)
4. Describe a solution to a problem as a series of simple steps

Data and Artificial Intelligence Concepts (10 test items)

1. Describe modern uses of AI (e.g., chatbots, LLMs, autonomous vehicles)
2. Describe basic applications of AI concepts (e.g., image processing, perception, game playing)
3. Discuss the use of datasets for training and refining AI models
4. Describe the uses of datasets for research, analysis, and business decisions
5. Explain how relational databases are structured (e.g., tables, keys, relationships)

* Sources: These learning outcomes are based on content from the K-12 Computer Science Standards and Ohio's Learning Standards in Computer Science.

Cybersecurity Concepts (5 test items)

1. Describe the dangers of unprotected information (e.g., identity theft, scams, doxing)
2. Identify common scams and attacks (e.g., phishing, scam emails, viruses)
3. Describe the importance and use of common digital security measures (e.g., strong passwords, password managers, multi-factor authentication, antivirus)
4. Describe common network security measures (e.g., firewalls, antivirus, permissions and account management)

Networks and the Internet (5 test items)

1. Describe networks and their relevance to the modern internet
2. Describe the importance of networking protocols for communication and security
3. Identify common networking protocols (e.g., TCP/IP, UDP, SNMP)
4. Identify internet connection equipment for a home or small office

Hardware and Systems Concepts (10 test items)

1. Describe computer components (e.g., CPU, motherboard, GPU)
2. Describe operating system responsibilities
3. Translate between binary and decimal number representations
4. Describe how computer hardware and software interact to process instructions

References

BootDev. *A complete overview of computer science for beginners*. <https://blog.boot.dev/computer-science/computer-science-for-beginners/>

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Ohio Department of Education. *Ohio's Learning Standards in Computer Science*. https://education.ohio.gov/getattachment/Topics/Learning-in-Ohio/Computer-Science/Ohio-s-Learning-Standards-in-Computer-Science/OCS_Adopted-2022.pdf.aspx?lang=en-US